August 8, 2025
File No. 2024042

City of Keene
Community Development Department – Planning and Zoning
3 Washington Street
Keene, New Hampshire 03431

Re: Addendum to: G2 Holdings – Keene Quarry Expansion – 2024 Hydrogeologic Investigation Report

Dear Community Development Department – Planning and Zoning;

Frontier Geoservices, LLC. (Frontier) is pleased to present this addendum to the G2 Holdings – Keene Quarry Expansion – 2024 Hydrogeologic Investigation Report. The contents of this report contain additional information on the hydrogeological conditions at the above referenced Site located at 57 Route 9, Keene New Hampshire, which is identified on the City of Keene Tax Map 215 Block 7.

Purpose of Addendum

This addendum has been prepared to document supplemental hydrogeologic investigations conducted in response to uncertainties regarding groundwater elevations observed in historic monitoring well SRL-12. The quarry expansion plan proposes excavation to depths below the previously reported static water level in SRL-12, prompting the need for further subsurface characterization.

Although historical data from adjacent test pits and monitoring wells suggested that groundwater would not be encountered at the proposed excavation depths, the anomalously shallow water levels recorded in SRL-12 introduced ambiguity that warranted further investigation. To address this uncertainty and support excavation planning, additional lithologic logging and groundwater observations were completed within the proposed quarry expansion area.

Summary of Field Activities

To resolve uncertainties related to groundwater elevation in the vicinity of monitoring well SRL-12, a targeted hydrogeologic investigation was performed by Frontier Geoservices, LLC. Field activities involved the installation of five additional monitoring wells: MW-9, BRW-9, BRW-10, BRW-11, and BRW-12 and comprehensive groundwater level monitoring of all site wells. All drilling was performed by Geosearch Environmental Contractor under the oversight of Frontier Geoservices personnel.

Please refer to **Attachment A** for a **Monitoring Well Location Map.**

Frontier Geoservices, LLC.
127 Old Warner Road
Bradford, NH 03221
T (603) 748-3715

Drilling and Well Installation

MW-9

Monitoring well MW-9 was installed on July 14, 2025, to a total depth of 9 feet below ground surface (bgs). Drilling was conducted using a track-mounted Diedrich D-50 drill rig employing hollow-stem auger methods. Lithology was logged by Frontier Geoservices staff from drill cuttings.

The subsurface profile at MW-9 consisted of fragmented bedrock with a minor sand and gravel component from ground surface to the termination depth of 9 feet bgs. The material was described as dry throughout, and refusal was encountered at 9 feet, indicating shallow bedrock.

No groundwater was encountered during drilling, and the borehole remained dry during the stabilization period. Groundwater observations conducted approximately 8 days after installation still indicated dry conditions.

BRW-9

Monitoring well BRW-9 was installed on July 14, 2025, and advanced to a total depth of 50 feet bgs using hollow-stem auger methods followed by a 3-inch air hammer.

The upper 9 feet of the boring consisted of light gray, fragmented bedrock with minor sand and gravel content, logged as dry. From 9 to 50 feet bgs, drilling encountered a light gray to tan, highly weathered schist, which was fine- to medium-grained, extremely friable, and lacked competent rock fragments. The recovered cuttings exhibited mica, imparting a subtle sheen and platy texture to some samples. Trace amounts of pyrite were observed in select intervals as fine, disseminated grains.

A subhorizontal fracture was encountered at approximately 23.5 feet bgs, which yielded approximately 3 gallons per minute of groundwater during air rotary drilling. No staining or mineral precipitates were observed along the fracture.

The well was completed with the screened interval positioned to intercept the observed water-producing zone. Water level monitoring conducted approximately 8 days post-installation recorded a stabilized depth to water of 9.44 feet bgs, corresponding to an elevation of 877.37 feet AMSL.

BRW-10

Monitoring well BRW-10 was installed on July 15, 2025, and advanced to a total depth of 85 feet bgs using hollow-stem auger methods followed by a 3-inch air hammer.

From 0 to 16 feet bgs, drilling encountered light gray, weathered and fragmented bedrock with minor sand content. This interval consisted of angular rock fragments mixed with medium- to coarse-grained sand, interpreted as a transition zone between overburden and underlying bedrock, likely representing in-place mechanical breakdown. The interval was dry and yielded no competent fragments.

From 16 to 85 feet bgs, the boring encountered light gray to tan, highly weathered schist, recovered as extremely friable, fine- to medium-grained cuttings. Mica was present throughout, giving portions of the sample a platy texture and subtle sheen. Trace disseminated pyrite was observed in select intervals. Though the rock is inferred to be schistose, foliation could not be confirmed due to sample disaggregation during drilling.

Two notable fracture features were encountered:

- At 23.5 feet bgs, a subhorizontal fracture produced an estimated 3 gallons per minute of groundwater during air rotary drilling.
- At 71.6 feet bgs, a narrow, clean fracture was intersected, which contributed to an increase in total airlift recovery to approximately 5 gallons per minute, likely due to cumulative flow from both fractures. No staining or mineral precipitates were observed.

Post-installation groundwater monitoring recorded a stabilized depth to water of 34.41 feet bgs, corresponding to an elevation of 849.93 feet AMSL, approximately 8 days after well installation.

BRW-11

Monitoring well BRW-11 was installed on July 16, 2025, to a total depth of 85 feet bgs. Drilling was conducted using a combination of hollow-stem auger, 3-inch air hammer, and air roller methods.

From 0 to 18 feet bgs, the boring advanced through light gray, weathered and fragmented bedrock with a minor sand component, interpreted as a transition zone between overburden and underlying bedrock. Material was dry and composed of angular fragments mixed with medium- to coarse-grained sand, indicative of in-place mechanical breakdown of the upper bedrock surface.

Between 18 and 48 feet bgs, drilling encountered highly weathered schist, which was light gray to tan, fine- to medium-grained, and extremely friable, with no competent fragments recovered. Muscovite mica was present throughout, giving the cuttings a platy texture and subtle sheen. Trace disseminated pyrite was observed in some intervals.

At approximately 48 feet bgs, a sand- and silt-filled fracture was encountered, yielding less than 1 gallon per minute of groundwater. The infilled nature and low flow suggest limited connectivity or permeability. Drilling conditions degraded significantly at this depth due to the fragility of the formation.

From 51 to 85 feet bgs, the boring continued through extremely weak and poorly consolidated schist, which displayed even lower competency than the overlying material. Due to persistent fragmentation and unstable borehole conditions, the drilling method was switched from air rotary to air roller at 51 feet. Cuttings continued to exhibit abundant mica and minor pyrite, consistent with the schist observed at shallower depths.

Groundwater level measurements approximately 7 days after installation indicated a stabilized water level of 46.34 feet bgs, equivalent to 838.84 feet AMSL.

BRW-12

Monitoring well BRW-12 was installed on July 17, 2025, and advanced to a total depth of 90 feet bgs using hollow-stem auger and 3-inch air roller methods.

From 0 to 9 feet bgs, the boring encountered light gray, highly weathered schist, which was more competent than similar intervals observed in adjacent wells. While no clear contact was observed between overburden and competent bedrock, the material exhibited sufficient structural cohesion to behave as bedrock during drilling. Schistosity was inferred from subtle platy textures and the presence of mica, and small competent rock fragments were recovered.

Between 9 and 78 feet bgs, drilling progressed through highly weathered schist that was light gray to tan, fine- to medium-grained, and extremely friable, with no competent fragments recovered. Mica was prevalent, giving the material a subtle sheen, and trace pyrite was observed as fine disseminated grains. Although the rock was inferred to be schistose, foliation could not be definitively identified due to the nature of the drilling method.

At approximately 78 feet bgs, the boring encountered an abrupt contact with a more intact, tan, moist, hard, competent schist. The unit was mica-rich, producing fine- to medium-sand–sized cuttings with a silvery sheen due to the high mica content. This zone extended from 78 to 90 feet bgs, where drilling was terminated.

Groundwater level measurements collected approximately 5 days after well installation indicated a stabilized depth to water of 54.60 feet bgs, corresponding to an elevation of 832.14 feet AMSL.

Please refer to **Attachment B** for **Boring & Monitoring Well Construction Logs.**

Well Development

Following installation, each monitoring well was developed using a Geotech GeoSub2® submersible pump on July 22, 2025. Wells were purged and surged continuously until clean, low-turbidity water was observed. Development procedures ensured removal of fine-grained material introduced during drilling, improved hydraulic connectivity to surrounding formation, and stabilized the water column for future sampling. None of the wells went dry during development, with sustained yields observed in the range of 3 to 5 gallons per minute, indicating sufficient recharge and hydraulic capacity for ongoing monitoring activities.

August 5, 2025 Comprehensive Groundwater Level Monitoring Event

On August 5, 2025, Frontier Geoservices, LLC conducted a comprehensive synoptic round of groundwater level monitoring across both overburden and bedrock monitoring wells. The event aimed to evaluate static groundwater conditions under consistent hydrologic settings, supporting assessments related to potential quarry expansion.

Overburden Monitoring Wells (MW-1 through MW-5 and MW-9)
Of the six monitored overburden wells, five were dry during the event, indicating the absence of saturated conditions within surficial soils across most of the site. MW-2, located in a lower-lying area, exhibited trace groundwater (<3 inches below ground surface), suggestive of a perched or discontinuous zone of saturation. These results are consistent with previous monitoring rounds and support the interpretation that a continuous water table is not present in the overburden.

Existing Bedrock Monitoring Wells (BRW-1 through BRW-8)
Only BRW-7 showed measurable groundwater, with a static water level of 2.78 feet bgs (1179.22 feet AMSL). This water is associated with a shallow fracture zone at approximately 5 feet bgs, which likely provides localized recharge. All other existing bedrock wells were dry, including BRW-8, which intersects a fracture at 9 feet bgs that has produced water in the past but was found to be dry during this event. These results indicate limited connectivity and recharge within shallow bedrock fractures.

New Bedrock Monitoring Wells (BRW-9 through BRW-12)
Water levels were observed in all four newly installed bedrock wells:

- BRW-9: Water at 9.44 ft bgs (877.37 ft AMSL); associated with a productive fracture at 23.5 ft.
- BRW-10: Water at 34.41 ft bgs (845.59 ft AMSL); cumulative yield from intersecting fractures at 23.5 and 71.6 ft.
- BRW-11: Water at 46.34 ft bgs (834.66 ft AMSL); limited recharge from a sand- and silt-filled fracture at 48 ft.
- BRW-12: Water at 54.60 ft bgs (828.40 ft AMSL); competent bedrock unit with no observed active flow.

These results reflect deeper, fracture-controlled groundwater in the bedrock system, with variability in hydraulic connectivity and recharge across the site.

Based on groundwater elevations measured during the August 5, 2025 monitoring round, groundwater flow is inferred to be generally toward the south. This is consistent with site topography and the relative elevations of the monitored wells and supports the interpretation that recharge from precipitation is transmitted downgradient toward the base of the quarry and/or the intermittent stream corridor**.**

Please refer to **Attachment C** for a **Groundwater Elevation Table** and **Attachment D** for a **Groundwater Flow Direction Map.**

Stream Observation

In conjunction with groundwater monitoring, the intermittent stream located east of the proposed quarry expansion area was walked to assess surface water conditions. While no active flow was observed at the time of inspection, several standing puddles were present, indicating that the streambed does retain water intermittently. This observation is consistent with the National Wetlands Inventory (NWI) Database, which maps this feature as an intermittent stream. These findings further

support the conclusion that surface water-groundwater interaction is limited or seasonally variable within the project area.

Hydrogeological Conceptual Model

The hydrogeologic setting of the site is characterized by a thin, highly permeable overburden layer overlying metamorphic bedrock of varying structure and weathering intensity. The behavior of groundwater at the site is governed by the physical properties of both the surficial materials and the underlying bedrock, as well as the nature of regional topography and surface water features.

Overburden Conditions

The overburden across the site consists primarily of coarse-textured, unconsolidated material with high hydraulic conductivity. This results in minimal residence time for infiltrating precipitation. Rainfall that does not run off is rapidly transmitted downgradient, particularly following precipitation events, with limited capacity for storage or perched saturation.

Groundwater level monitoring confirms that the overburden remains largely unsaturated, with only localized, trace saturation (e.g., MW-2) potentially representing perched or discontinuous zones. The majority of groundwater transmitted through the overburden is presumed to discharge downgradient to the intermittent stream east of the site or toward the base of the existing quarry excavation.

Bedrock Conditions and Variability

A notable contrast exists between the character of the bedrock observed in older and newer monitoring wells:

- BRW-1 through BRW-8 encountered massive, hard, and non-friable schist with minimal weathering and limited fracture development. These wells exhibited either no groundwater yield or extremely shallow, localized flow conditions. The bedrock in this portion of the site acts as a relatively impermeable barrier to infiltration, with minimal primary porosity and low permeability outside of discrete fracture zones.
- In contrast, BRW-9 through BRW-11 encountered bedrock that is more weathered and saprolite-like in character, with a friable texture and higher secondary porosity. These zones exhibit greater capacity for storing and transmitting infiltrated water, and the transition from overburden to bedrock is more gradational. Nevertheless, fracture flow remains the dominant mechanism for groundwater movement in these wells, with productive features encountered at discrete intervals (e.g., 23.5 ft and 71.6 ft bgs).
- BRW-12, while also productive, intersected competent, less weathered schist at depth, yielding low or no flow, further emphasizing the heterogeneity of the bedrock system across the site.

Surface Water Interaction

The intermittent stream east of the quarry expansion area provides a key hydrologic boundary. During the August 5, 2025 field investigation, no active flow was observed but standing water (puddles) were present in the channel. The stream is mapped as intermittent in the National Wetlands

Inventory and likely represents a seasonal or storm-driven discharge zone for groundwater moving through the overburden and shallow fractured bedrock.

Summary

The site's hydrogeology can be summarized as follows:

- Rapid infiltration and downgradient transmission of recharge through permeable overburden.
- Localized perched water or shallow saturation in discrete areas.
- Low groundwater occurrence in massive, unweathered bedrock (BRW-1 through BRW-8).
- Enhanced porosity and flow in weathered, saprolitic bedrock (BRW-9 through BRW-11).
- Fracture-controlled groundwater movement dominates across all bedrock zones.
- The intermittent stream and quarry base serve as primary discharge boundaries.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Frontier Geoservices, LLC.

Joel Banaszak, P.G.
President

Attachments
c: File No. 2024012 (w/attachments)

ATTACHMENTS

Attachment A
Monitoring Well Location Map

ACID ROCK DRAINAGE (ARD) MONITORING		
MONITORING LOCATION	TESTING MONTHS	FREQUENCY
SLR-10	APRIL & OCTOBER	BI-ANNUALLY
SLR-11	APRIL & OCTOBER	BI-ANNUALLY
SLR-12	APRIL & OCTOBER	BI-ANNUALLY
BR-1	APRIL & OCTOBER	BI-ANNUALLY
BR-2	APRIL & OCTOBER	BI-ANNUALLY
BR-3	APRIL & OCTOBER	BI-ANNUALLY
BR-4	APRIL & OCTOBER	BI-ANNUALLY
BR-5	APRIL & OCTOBER	BI-ANNUALLY
BR-6	APRIL & OCTOBER	BI-ANNUALLY
BR-7	APRIL & OCTOBER	BI-ANNUALLY
BR-8	APRIL & OCTOBER	BI-ANNUALLY
SWS-1	APRIL & OCTOBER	BI-ANNUALLY UNTIL START OF PERIOD 8
SWS-2	APRIL & OCTOBER	BI-ANNUALLY AFTER START OF PERIOD 1
SWS-3	APRIL & OCTOBER	BI-ANNUALLY AFTER START OF PERIOD 21
SWS-4	APRIL & OCTOBER	BI-ANNUALLY AFTER START OF PERIOD 5
SWS-5	APRIL & OCTOBER	BI-ANNUALLY AFTER START OF PERIOD 8

WATER LEVEL MONITORING	
MONITORING LOCATION	FREQUENCY
SLR-10	MONTHLY
SLR-11	MONTHLY
SLR-12	MONTHLY
MW-2	MONTHLY
MW-4	MONTHLY
BR-7	MONTHLY
BR-8	MONTHLY
SWS-6	MONTHLY
SWS-7	MONTHLY
SWS-8	MONTHLY
SWS-9	MONTHLY
SWS-10	MONTHLY
SWS-11	MONTHLY

AMD FORMATION STANDARDS	
ANALYTE	STANDARD
SPECIFIC CONDUCTANCE	NO STANDARD
OXIDATION REDUCTION POTENTIAL	NO STANDARD
DISSOLVED OXYGEN	75%/5 mg/L
TURBIDITY	10 NTU (BEYOND NATURALLY OCCURRING CONDITIONS)
pH	6.0 SU
ARSENIC	5 μg/L
COPPER	1,300 μg/L
IRON	300 μg/L
MANGANESE	300 μg/L
NICKEL	100 μg/L
LEAD	15 μg/L

TEST PITS

ID	EXISTING GRADE	LEDGE	GROUNDWATER	E.S.H.W.T.
TP-1	986.0	3.1'	NONE FOUND	NONE FOUND
TP-2	926.0	NONE	NONE FOUND	20"
TP-3	1180.0	NONE	NONE FOUND	NONE FOUND
TP-4	1158.0	NONE	NONE FOUND	32"
TP-5	1190.0	0.5'	NONE FOUND	NONE FOUND
TP-6	887.0	873.0	NONE FOUND	NONE FOUND

OVERBURDEN WELLS

WELL	EXISTING GRADE	LEDGE	GROUNDWATER
MW-1	950.0	3.3'	NONE FOUND
MW-2	944.0	12'	NONE FOUND
M3-3	1052.0	14.2'	NONE FOUND
MW-4	1103.0	3.1'	NONE FOUND
MW-5	1112.0	5'	NONE FOUND
MW-6	1192.0	0.9'	NONE FOUND
MW-7	1178.0	1.9'	NONE FOUND
MW-8	1182.0	1.1'	NONE FOUND
MW-9	884.38	XX	XX

BEDROCK WELLS

Well	Ground Elevation (ft AMSL)	Bedrock Depth (feet)	Depth/Bottom Elevation (feet/ ft AMSL)	Proposed Pit Floor Elevation (ft AMSL)	Groundwater Elevation (ft AMSL)
BRW-1	950	3	54/896	950	DRY
BRW-2	944	12	62/882	940	DRY
BRW-3	1052	14	51/1,001	1,050	DRY
BRW-4	1,103	3	81/1,022	1,098	DRY
BRW-5	1,112	3	141/971	1,098	DRY
BRW-6	1,192	1	142/1,050	1,098	DRY
BRW-7	1,178	1.9	141/1,037	1,098*	1,177.04
BRW-8	1,182	1	141/1,041	1,098*	1,179.16

*Well is located outside of project area. The pit floor elevation that is noted is the proposed elevation of the nearest excavation.

WELL	EXISTING GRADE	TOP OF WELL	LEDGE	GROUNDWATER
BRW-9	884.31	886.81	XX	XX
BRW-10	879.94	884.34	XX	XX
BRW-11	881.39	885.19	XX	XX
BRW-12	882.74	886.74	XX	XX

ON-SITE WATER QUALITY MONITORING NOTES (ARD MONITORING)

1. PH, SPECIFIC CONDUCTANCE, OXIDATION, REDECTION POTENTIAL, DISSOLVED OXYGEN AND TURBITY AND LABRATORY ANALYSIS OF DISSOLVED AND TOTAL METALS INCLUDING; ARSENIC, COPPER, IRON, MAGNESE, NICKEL AND LEAD WILL BE TESTED AT EACH LOCATION

INITIAL RESPONSE ACTION – AMD DETECTION

IF A SURFACE AND/OR GROUNDWATER SAMPLING LOCATION PRESENTS RESULTS THAT ARE INDICATIVE OF THE FORMATION OF ACID MINE DRAINAGE, NHDES AND THE CITY OF KEENE WILL BE NOTIFIED IMMEDIATELY. FURTHERMORE, THE FOLLOWING IMMEDIATE INITIAL RESPONSE ACTIONS WILL BE IMPLEMENTED.

1. ALL ACTIVE QUARRYING/MINING OPERATIONS OCCURRING IN THE AFFECTED AREA WILL CEASE AND EXPOSED BEDROCK SURFACES SHALL BE EXPEDITIOUSLY RESTORED TO HAVE A MINIMUM THICKNESS OF 3-FEET OF COVER MATERIAL. THE COVER MATERIAL SHALL CONSIST OF A MINIMUM OF 30% CLAY CONTENT. COVER MATERIAL SHALL BE COMPACTED IN 1-FOOT LIFTS. THE INTENT OF THE CLAY CONTENT AND COMPACTION IS TO LIMIT AIR AND SURFACE WATER CONTACT WITH THE SOURCE OF THE ACID MINE DRAINAGE.
2. ANY DOWNSLOPE AFFECTED DRAINAGES WHICH MAY BE CONTRIBUTING/CONVEYING ACID MINE DRAINAGE SHALL BE ARMORED WITH 1-FOOT OF 2-INCH MINUS, CRUSHED, LIMESTONE GRAVEL.
3. THE FREQUENCY OF SURFACE WATER AND GROUNDWATER MONITORING FOR ACID MINE DRAINAGE WILL BE INCREASED TO A QUARTERLY BASIS.
4. ALL SURFACE WATER WITHIN ½-MILE DOWNGRADIENT OF THE DETECTED ACID MINE DRAINAGE SHALL BE SAMPLED WITHIN 2-WEEKS OF THE INITIAL DETECTION AND BE INCLUDED IN THE SURFACE WATER MONITORING PROGRAM.
5. SAMPLING OF ALL DOMESTIC WATER SUPPLY WELLS WITHIN ½-MILE OF THE AFFECTED AREA FOR ACID MINE DRAINAGE PARAMETERS WILL OCCUR WITHIN 2-WEEKS OF THE INITIAL DETECTION AND CONTINUE TO BE SAMPLED ON A QUARTERLY BASIS.
   A. IF ACID MINE DRAINAGE IS DETECTED IN A DOMESTIC WATER SUPPLY WELL THE HOMEOWNER SHALL BE OFFERED TO HAVE A "POINT-OF-USE" WATER TREATMENT SYSTEM INSTALLED AND MAINTAINED WHILE A NEW, UNIMPACTED, DOMESTIC WATER SUPPLY IS MADE AVAILABLE AT NO COST TO THE HOMEOWNER.
6. A GROUNDWATER QUALITY ASSESSMENT IN THE AREAS ADJACENT TO THE DETECTED ACID MINE DRAINAGE WILL BE INITIATED.
   A. THE GROUNDWATER QUALITY ASSESSMENT SHALL INCLUDE THE INSTALLATION OF A MINIMUM OF THREE (3) MONITORING WELLS; ONE UPGRADIENT OF THE AFFECTED SURFACE WATER, AND TWO DOWN-GRADIENT OF THE AFFECTED SURFACE WATER. ADDITIONAL MONITORING WELLS MAY BE REQUIRED TO DETERMINE THE HORIZONTAL AND VERTICAL DISTRIBUTION OF THE GROUNDWATER IMPACTS.
   B. GROUNDWATER SAMPLES WILL BE COLLECTED WITHIN 2 WEEKS OF INSTALLATION AND ANALYZED FOR ACID MINE DRAINAGE PARAMETERS LISTED ABOVE. A SECOND, CONFIRMATORY ROUND OF SAMPLING WILL OCCUR 2-WEEKS AFTER THE INITIAL SAMPLING ROUND. MONITORING WELLS WILL BE SAMPLED ON A QUARTERLY BASIS IF ACID MINE DRAINAGE IMPACTS ARE DETECTED.

OFF-SITE WATER QUALITY MONITORING NOTES

1. LAND OWNERS WITHIN ½ MILE OF THE EXCAVATION SITE WILL BE OFFERED GROUNDWATER QUALITY MONITORING.
2. NOTIFICATIONS WILL BE MADE TO LANDOWNERS WITH THE OPTION TO ALLOW OR DECLINE MONITORING.

BASELINE MONITORING

3. TWO ROUNDS OF SAMPLING WILL OCCUR A MINIMUM OF 14 CALENDAR DAYS APART.
4. SAMPLES WILL BE ANALYZED FOR VOLATILE ORGANIC COMPOUNDS AND NITRATE.
5. RESULTS WILL BE SENT TO THE LAND OWNER, THE CITY OF KEENE, & TOWN OF SULLIVAN.

ON-GOING MONITORING

6. BI-ANNUAL BASIS OF WELLS DURING THE TERM OF THE PERMIT.
7. BI-ANNUAL BASIS OF WELLS TWO (2) YEARS FOLLOWING THE CEASE OF OPERATIONS AT THE SITE AND RECLAMATION.
4. SAMPLES WILL BE ANALYZED FOR VOLATILE ORGANIC COMPOUNDS AND NITRATE.
5. RESULTS WILL BE SENT TO THE LAND OWNER, THE CITY OF KEENE, & TOWN OF SULLIVAN.

ADVERSE IMPACTS

6. DRINKING WATER RESULTS WILL BE COMPARED TO THE NHDES AMBIENT GROUNDWATER QUALITY STANDARDS (AGQS).
7. IF ADVERSE IMPACTS ARE NOTED, THE APPLICANT WILL IMMEDIATELY BE NOTIFIED TO CEASE BEDROCK EXCAVATION.
8. NHDES, THE CITY OF KEENE, AND TOWN OF SULLIVAN WILL BE NOTIFIED.
9. IF MONITORING INDICATES THE EXCAVATION ACTIVITIES CAUSED THE IDENTIFIED CONTAMINATION, A LICENSED NH WELL CONTRACTOR WILL BE IMMEDIATELY RETAINED FOR INSTALLATION OF A NEW WATER SUPPLY WELL IN AN AREA THAT HAS NOT BEEN IMPACTED BY CONTAMINATION.
10. COST OF WELL WILL BE THE SOLE RESPONSIBILITY OF THE APPLICANT.

BEST MANAGEMENT PRACTICES FOR BLASTING

ALL ACTIVITIES RELATED TO BLASTING SHALL FOLLOW BEST MANAGEMENT PRACTICES (BMPS) TO PREVENT CONTAMINATION OF GROUNDWATER INCLUDING PREPARING, REVIEWING AND FOLLOWING AN APPROVED BLASTING PLAN; PROPER DRILLING, EXPLOSIVE HANDING AND LOADING PROCEDURES; OBSERVING THE ENTIRE BLASTING PROCEDURES; EVALUATING BLASTING PERFORMANCE; AND HANDLING AND STORAGE OF BLASTED ROCK.

(1) LOADING PRACTICES. THE FOLLOWING BLASTHOLE LOADING PRACTICES TO MINIMIZE ENVIRONMENTAL EFFECTS SHALL BE FOLLOWED:
 (a) DRILLING LOGS SHALL BE MAINTAINED BY THE DRILLER AND COMMUNICATED DIRECTLY TO THE BLASTER. THE LOGS SHALL INDICATE DEPTHS AND LENGTHS OF VOIDS, CAVITIES, AND FAULT ZONES OR OTHER WEAK ZONES ENCOUNTERED AS WELL AS GROUNDWATER CONDITIONS. IF A FRACTURE OR WATER BEARING ZONE IS ENCOUNTERED IN A BOREHOLE, NO BLASTING SHALL OCCUR AT THAT LOCATION.
 (b) EXPLOSIVE PRODUCTS SHALL BE MANAGED ON SITE SO THAT THEY ARE EITHER USED IN THE BOREHOLE, RETURNED TO THE DELIVERY VEHICLE, OR PLACED IN SECURE CONTAINERS FOR OFF SITE DISPOSAL.
 (c) SPILLAGE AROUND THE BOREHOLE SHALL EITHER BE PLACED IN THE BOREHOLE OR CLEANED UP AND RETURNED TO AN APPROPRIATE VEHICLE FOR HANDLING OR PLACEMENT IN SECURED CONTAINERS FOR OFF-SITE DISPOSAL.
 (d) LOADED EXPLOSIVES SHALL BE DETONATED AS SOON AS POSSIBLE AND SHALL NOT BE LEFT IN THE BLASTHOLES OVERNIGHT, UNLESS WEATHER OR OTHER SAFETY CONCERNS REASONABLY DICTATE THAT DETONATION SHOULD BE POSTPONED.
 (e) LOADING EQUIPMENT SHALL BE CLEANED IN AN AREA WHERE WASTEWATER CAN BE PROPERLY CONTAINED AND HANDLED IN A MANNER THAT PREVENTS RELEASE OF CONTAMINANTS TO THE ENVIRONMENT.
 (f) EXPLOSIVES SHALL BE LOADED TO MAINTAIN GOOD CONTINUITY IN THE COLUMN LOAD TO PROMOTE COMPLETE DETONATION. INDUSTRY ACCEPTED LOADING PRACTICES FOR PRIMING, STEMMING, DECKING AND COLUMN RISE NEED TO BE ATTENDED TO.

(2) EXPLOSIVE SELECTION. THE FOLLOWING BMPS SHALL BE FOLLOWED TO REDUCE THE POTENTIAL FOR GROUNDWATER CONTAMINATION WHEN EXPLOSIVES ARE USED:
 (a) EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT ARE APPROPRIATE FOR SITE CONDITIONS AND SAFE BLAST EXECUTION.
 (b) EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT HAVE THE APPROPRIATE WATER RESISTANCE FOR THE SITE CONDITIONS PRESENT TO MINIMIZE THE POTENTIAL FOR HAZARDOUS EFFECT OF THE PRODUCT UPON GROUNDWATER.

(3) PREVENTION OF MISFIRES. APPROPRIATE PRACTICES SHALL BE DEVELOPED AND IMPLEMENTED TO PREVENT MISFIRES.

(4) MUCK PILE MANAGEMENT. MUCK PILES (THE BLASTED PIECES OF ROCK) AND ROCK PILES SHALL BE MANAGED IN A MANNER TO REDUCE THE POTENTIAL FOR CONTAMINATION BY IMPLEMENTING THE FOLLOWING MEASURES:
 (a) REMOVE THE MUCK PILE FROM THE BLAST AREA AS SOON AS REASONABLY POSSIBLE.
 (b) MANAGE THE INTERACTION OF BLASTED ROCK PILES AND STORMWATER TO PREVENT CONTAMINATION OF WATER SUPPLY WELLS OR SURFACE WATER.

(5) SPILL PREVENTION MEASURES AND SPILL MITIGATION. SPILL PREVENTION AND SPILL MITIGATION MEASURES SHALL BE IMPLEMENTED TO PREVENT THE RELEASE OF FUEL AND OTHER RELATED SUBSTANCES TO THE ENVIRONMENT. THE MEASURES SHALL INCLUDE AT A MINIMUM:
 (a) THE FUEL STORAGE REQUIREMENTS SHALL INCLUDE
  1. STORAGE OF REGULATED SUBSTANCES ON AN IMPERVIOUS SURFACE.
  2. SECURE STORAGE AREAS AGAINST UNAUTHORIZED ENTRY.
  3. LABEL REGULATED CONTAINERS CLEARLY AND VISIBLY.
  4. INSPECT STORAGE AREAS WEEKLY.
  5. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS.
  6. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS.
  7. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED
 (a) THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
  1. EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED.
  2. PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS.
  3. HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS.
  4. USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES.
  5. PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
 (a) THE TRAINING OF ON-SITE EMPLOYEES AND THE ON SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
 (b) FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT WILL COMPLY WITH THE REGULATIONS OF NHDES [NOTE THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6: "BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT" OR ITS SUCCESSOR DOCUMENT.]

SUBSURFACE DATA						
LOG	EXISTING GROUND	PROPOSED GRADE	LEDGE	DEPTH TO GROUNDWATER	WELL BOTTOM	GROUNDWATER ELEV.
SLR-4	888.0	880.0	873.0	NONE FOUND	873.0	NONE FOUND
SLR-10	884.0	855.0	NONE TO 829.0	42.9	828.0	841.1
SLR-11	871.5.0	855.0	NONE TO 795.5	NONE TO 45.2	817.8	826.3
SLR-12	885.0*	885.0	877.5	1.5	850.5	883.5**

SUBSURFACE DATA FROM TEST PIT, BORING, AND WELL INSTALLATION LOGS CONTAINED IN THE LIMITED GEOHYDROLOGIC INVESTIGATION BY SLR INTERNATIONAL CORPORATION, DATED MARCH 25, 2022.

* ELEVATION BASED ON CURRENT SURVEY

GRANITE ENGINEERING
civil engineering
land planning
municipal services

REVISIONS			
No.	DATE	COMMENTS	BY
1	12/20/24	PROJECT SUBMITTAL	JD
2	2/3/25	REVISED PER CITY COMMENTS	JD
3	5/9/25	REVISED PER CITY COMMENTS	JD
4	7/9/25	REVISED PER CITY COMMENTS	JD
5	7/24/25	ADDITIONAL WELL LOCATIONS	JD

OWNER/APPLICANT:
G2 HOLDINGS, LLC
250 NORTH STREET
JAFFREY, NH 03452

GRANITE ENGINEERING
civil engineering • land planning • municipal services
150 Dow Street, Tower 2, Suite 421
Manchester,
New Hampshire 03101
603.518.8030
www.GraniteEng.com

STAMP:
STATE OF NEW HAMPSHIRE
BRENTON COLE
No. 14764
7/9/25
LICENSED PROFESSIONAL ENGINEER

LOCATION:
KEENE TAX MAP 215 LOTS 7 & 8
SULLIVAN TAX MAP 5 LOTS 46 & 46-1
57 ROUTE 9
KEENE & SULLIVAN, NEW HAMPSHIRE
CHESHIRE COUNTY

PROJECT:
GORDON SERVICES
KEENE

TITLE:
MONITORING PLAN

PROJECT No.: 23-0201-1
DATE: MAY 9, 2025
SCALE: HORIZ. 1"=125'
SHEET: 17 OF 23

Attachment B
Boring & Monitoring Well Construction Logs

FRONTIER GEOSERVICES	**PROJECT** Gordon Services - Keene Pit 21 Route 9, Keene & Sullivan, New Hampshire	BORING NO. MW-9 SHEET 1 of 1 FILE NO. 2024012 CHKD. BY JFB

Boring Co.	Geosearch Environmental Contractors	Boring Location	See Boring Location Plan		
Driller	Michael DeAmicis	Ground Surface El.	884 FT AMSL	Datum	NAD83
Logged By	JFB	Date Start	7/14/2025	Date End	7/14/2025

Sampler Type:	Logged from cuttings
Sampler Size:	NA
Type Drill Rig:	Deidrich D-50 - Track Mounted
Drilling Method:	Hollow Stem Auger

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/22/2025	9:05:00 AM	DRY	DRY	~8 days
8/5/2025	10:00:00 AM	DRY	DRY	~3 weeks

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	WELL CONSTRUCTION DETAILS (NOT TO SCALE)
1							0 - 9' Fragmented bedrock with minor sand and gravel component. Dry.	
2								
3								
4								
5								
6								
7								
8								
9							Refusal at 9' BGS.	
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

GRANULAR SOILS (N-Values)	COHESIVE SOILS (N-Values)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
11 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	16 to 30 - Very Stiff
	Over 30 - Hard

SYMBOL KEY

1. S denotes split-barrel sampler.
2. U denotes 3-inch O.D. undisturbed sample.
3. UO denotes 3-inch Osterberg undisturbed sample.
4. PEN denotes penetration length of sampler.
5. REC denotes recovered length of sample.
6. SPT denotes Standard Penetration Test.
7. PID denotes Photoionization Detector
8. PPM denotes parts per million.
9. PP denotes Pocket Penetrometer.
10. FVST denotes field vane shear test.
11. RQD denotes Rock Quality Designation.
12. R denotes core run number.

Lithology logged from drill cuttings.

FRONTIER GEOSERVICES	**PROJECT** Gordon Services - Keene Pit 21 Route 9, Keene & Sullivan, New Hampshire	BORING NO. BRW-9 SHEET 1 of 1 FILE NO. 2024012 CHKD. BY JFB

Boring Co.	Geosearch Environmental Contractors	Boring Location	See Boring Location Plan		
Driller	Michael DeAmicis	Ground Surface El.	884 FT AMSL	Datum	NAD83
Logged By	JFB	Date Start	7/14/2025	Date End	7/14/2025

Sampler Type:	Logged from cuttings
Sampler Size:	N/A
Type Drill Rig:	Deidrich D-50 - Track Mounted
Drilling Method:	Hollow Stem Auger/3-inch Air Hammer

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/22/2025	9:10:00 AM	9.44' BGS	877.37	~8 days
8/5/2025	10:05:00 AM	10.71' BGS	876.1	~3 weeks

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	WELL CONSTRUCTION DETAILS (NOT TO SCALE)
5							0 - 9' Light gray, fragmented bedrock with minor sand and gravel component. Dry.	
10							9' - 50' Light gray to tan, highly weathered schist; fine- to medium-grained; recovered as extremely friable cuttings with no competent fragments. Mica is present throughout, giving portions of the sample a platy texture and subtle sheen. Trace pyrite observed in select cuttings, appearing as fine disseminated grains. Rock is inferred to be schistose, though foliation could not be confirmed due to sample disaggregation and the drilling method.	
15								
20								
25							23.5' Subhorizontal fracture was encountered. No staining or mineral precipitate was observed. The fracture yielded an estimated 3 gallons per minute of groundwater during air rotary drilling.	
30								
35								
40								
45								
50							Drilling terminated at 50' BGS.	
55								
60								
65								
70								
75								
80								
85								
90								
95								
100								

GRANULAR SOILS (N-Values)	COHESIVE SOILS (N-Values)	SYMBOL KEY	
0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

Lithology logged from drill cuttings.

FRONTIER GEOSERVICES

PROJECT

Gordon Services - Keene Pit

21 Route 9, Keene & Sullivan, New Hampshire

BORING NO.	BRW-10
SHEET	1 of 1
FILE NO.	2024012
CHKD. BY	JFB

Boring Co.	Geosearch Environmental Contractors	Boring Location	See Boring Location Plan		
Driller	Michael DeAmicis	Ground Surface El.	880 FT AMSL	Datum	NAD83
Logged By	JFB	Date Start	7/14/2025	Date End	7/15/2025

Sampler Type:	Logged from cuttings
Sampler Size:	N/A
Type Drill Rig:	Deidrich D-50 - Track Mounted
Drilling Method:	Hollow Stem Auger/3-inch Air Hammer

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/22/2025	9:15:00 AM	34.41' BGS	849.93	~8 days
8/5/2025	10:10:00 AM	32.44' BGS	851.9	~3 weeks

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	WELL CONSTRUCTION DETAILS (NOT TO SCALE)
5							0 - 16' Light gray, weathered and fragmented bedrock with a minor sand component. Material recovered as a mixture of angular rock fragments and medium- to coarse-grained sand, suggesting in-place mechanical breakdown of the upper bedrock surface. Likely represents a transition zone between overburden and underlying schist bedrock. No competent core fragments recovered. Dry.	
10								
15								
20							16 - 85' Light gray to tan, highly weathered schist; fine- to medium-grained; recovered as extremely friable cuttings with no competent fragments. Mica is present throughout, giving portions of the sample a platy texture and subtle sheen. Trace pyrite observed in select cuttings, appearing as fine disseminated grains. Rock is inferred to be schistose, though foliation could not be confirmed due to sample disaggregation and the drilling method.	
25								
30								
35							23.5' Subhorizontal fracture was encountered. No staining or mineral precipitate was observed. The fracture yielded an estimated 3 gallons per minute of groundwater during air rotary drilling.	
40								
45								
50								
55								
60								
65								
70							71.6' A narrow, clean fracture was encountered. The feature did not produce a notable increase in groundwater yield, though overall airlift recovery increased slightly from approximately 3 to 5 gallons per minute, likely reflecting cumulative flow from this and the previously identified fracture at 23.5 feet. No staining or mineral precipitate was observed. The fracture appeared less open than the shallower feature and may represent a more restricted flow path	
75								
80								
85							Drilling terminated at 85' BGS.	
90								
95								
100								

GRANULAR SOILS (N-Values)	COHESIVE SOILS (N-Values)	SYMBOL KEY	
0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

Lithology logged from drill cuttings.

FRONTIER GEOSERVICES

PROJECT

Gordon Services - Keene Pit

21 Route 9, Keene & Sullivan, New Hampshire

BORING NO.	BRW-11
SHEET	1 of 1
FILE NO.	2024012
CHKD. BY	JFB

Boring Co.	Geosearch Environmental Contractors	Boring Location	See Boring Location Plan		
Driller	Michael DeAmicis	Ground Surface El.	881 FT AMSL	Datum	NAD83
Logged By	JFB	Date Start	7/15/2025	Date End	7/16/2025

Sampler Type:	Logged from cuttings
Sampler Size:	N/A
Type Drill Rig:	Deidrich D-50 - Track Mounted
Drilling Method:	Hollow Stem Auger/3-inch Air Hammer/ Air Roller

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/22/2025	9:20:00 AM	46.34' BGS	838.84	~7 days
8/5/2025	10:15:00 AM	48.11' BGS	837.08	~3 weeks

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	WELL CONSTRUCTION DETAILS (NOT TO SCALE)
5							0 - 18' Light gray, weathered and fragmented bedrock with a minor sand component. Material recovered as a mixture of angular rock fragments and medium- to coarse-grained sand, suggesting in-place mechanical breakdown of the upper bedrock surface. Likely represents a transition zone between overburden and underlying schist bedrock. No competent core fragments recovered. Dry.	
10								
15								
20							18 - 48' Light gray to tan, highly weathered schist; fine- to medium-grained; recovered as extremely friable cuttings with no competent fragments. Mica is present throughout, giving portions of the sample a platy texture and subtle sheen. Trace pyrite observed in select cuttings, appearing as fine disseminated grains. Rock is inferred to be schistose, though foliation could not be confirmed due to sample disaggregation and the drilling method.	
25								
30								
35								
40								
45								
50							48' Sand- and silt-filled fracture was encountered. The feature yielded less than 1 gallon per minute of groundwater during air rotary drilling, suggesting limited connectivity or permeability. The fine-grained infill and lack of competent rock fragments indicate in-situ weathering or infilling of a structural void. The formation was fragile at this depth, and drilling conditions deteriorated, prompting a change in method from air rotary to air roller at 51 feet bgs.	
55								
60								
65								
70							51 - 85' Light gray, extremely weak and poorly consolidated schist, exhibiting even lower competency than the overlying material. Due to the fragile nature of the formation and persistent fragmentation, drilling was switched from air rotary to air roller at 51 feet. Cuttings contained abundant mica and minor pyrite, consistent with the schistose material observed at shallower depths.	
75								
80								
85							Drilling terminated at 85' BGS.	
90								
95								
100								

GRANULAR SOILS (N-Values)	COHESIVE SOILS (N-Values)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
11 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	16 to 30 - Very Stiff
	Over 30 - Hard

SYMBOL KEY

1. S denotes split-barrel sampler.
2. U denotes 3-inch O.D. undisturbed sample.
3. UO denotes 3-inch Osterberg undisturbed sample.
4. PEN denotes penetration length of sampler.
5. REC denotes recovered length of sample.
6. SPT denotes Standard Penetration Test.
7. PID denotes Photoionization Detector
8. PPM denotes parts per million.
9. PP denotes Pocket Penetrometer.
10. FVST denotes field vane shear test.
11. RQD denotes Rock Quality Designation.
12. R denotes core run number.

Lithology logged from drill cuttings.

FRONTIER GEOSERVICES	**PROJECT** Gordon Services - Keene Pit 21 Route 9, Keene & Sullivan, New Hampshire	BORING NO. BRW-12 SHEET 1 of 1 FILE NO. 2024012 CHKD. BY JFB

Boring Co.	Geosearch Environmental Contractors	Boring Location	See Boring Location Plan		
Driller	Michael DeAmicis	Ground Surface El.	883 FT AMSL	Datum	NAD83
Logged By	JFB	Date Start	7/16/2025	Date End	7/17/2025

Sampler Type:	Logged from cuttings
Sampler Size:	N/A
Type Drill Rig:	Deidrich D-50 - Track Mounted
Drilling Method:	Hollow Stem Auger/3-inch Air Roller

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/22/2025	9:25:00 AM	54.60' BGS	832.14	~5 days
8/5/2025	10:20:00 AM	57.64' BGS	829.1	~3 weeks

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	WELL CONSTRUCTION DETAILS (NOT TO SCALE)
5							0 - 9' Light gray, highly weathered schist; fine- to medium-grained. Material is more competent than that encountered in other borings, with limited structural integrity but sufficient cohesion to behave as bedrock during drilling. No distinct contact was observed between overburden and competent bedrock, indicating a gradational transition. Schistose character is inferred from mica content and subtle platy textures in cuttings. Small competent fragments were recovered, suggesting residual bedrock structure remains intact in portions of this interval.	
10								
15								
20							9 - 78' Light gray to tan, highly weathered schist; fine- to medium-grained. Material was recovered as extremely friable cuttings with no competent fragments. Mica is present throughout, imparting a subtle sheen and platy texture to portions of the sample. Trace pyrite observed in select cuttings as fine disseminated grains. Rock is inferred to be schistose; however, foliation could not be confirmed due to sample disaggregation and the limitations of the drilling method.	
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
80							78 - 90' Tan, moist, hard, competent fine- to medium-grained, mica-rich schist; cuttings produced by air roller drilling appeared as fine to medium sand; material exhibited high mica content, imparting a silvery sheen to cuttings. Abrupt contact encountered at top of unit.	
85								
90								
95							Drilling terminated at 90' BGS.	
100								

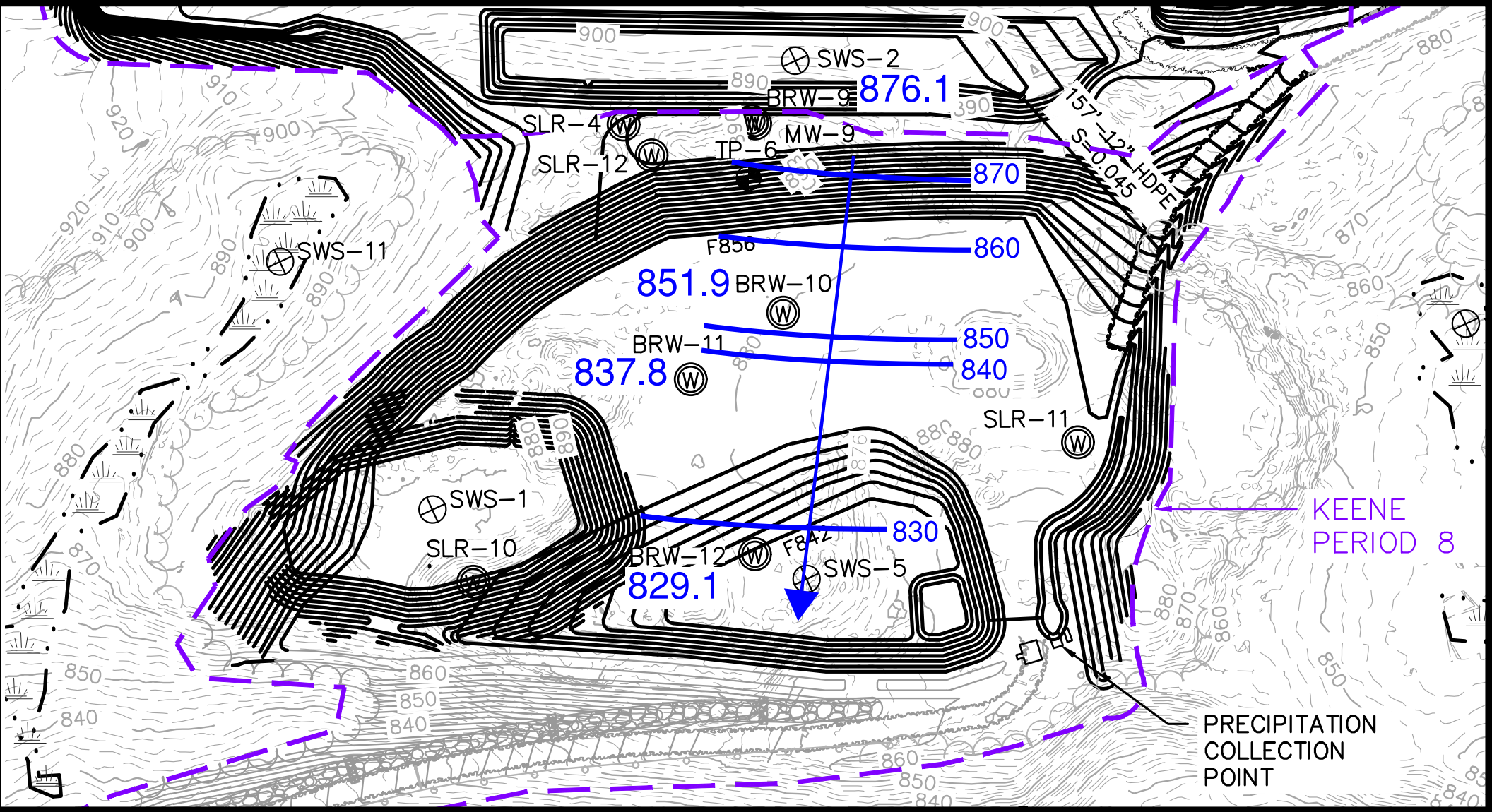
GRANULAR SOILS (N-Values)	COHESIVE SOILS (N-Values)	SYMBOL KEY	
0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

Lithology logged from drill cuttings.

Attachment C
Groundwater Elevation Table

Well ID	Well Type	GSE (ft AMSL)	DTW (ft bgs)	Water Elev. (ft AMSL)	Notes
MW-1	Overburden	950	Dry		No water observed
MW-2	Overburden	944	0.25	943.75	Trace water observed (<3")
MW-3	Overburden	1052	Dry		Dry
MW-4	Overburden	1103	Dry		Dry
MW-5	Overburden	1112	Dry		Dry
MW-9	Overburden	884	Dry		No water observed
BRW-1	Bedrock	950	Dry		Dry
BRW-2	Bedrock	944	Dry		Dry
BRW-3	Bedrock	1052	Dry		Dry
BRW-4	Bedrock	1103	Dry		Dry
BRW-5	Bedrock	1112	Dry		Dry
BRW-6	Bedrock	1192	Dry		Dry
BRW-7	Bedrock	1182	2.78	1179.22	Shallow fracture at 5' BGS; only BRW well with water
BRW-8	Bedrock	1182	Dry		Fracture at 9' BGS; previously produced water but dry on this date
BRW-9	Bedrock	884	9.44	877.37	Fracture flow at 23.5 ft
BRW-10	Bedrock	880	34.41	845.59	Fractures at 23.5 ft & 71.6 ft
BRW-11	Bedrock	881	46.34	834.66	Trace yield at 48 ft
BRW-12	Bedrock	883	54.6	828.4	No flow noted

Attachment D
Groundwater Flow Direction Map



Attachment D
Groundwater Flow Map
Gordon Service - Keene Pit

*Note limited groundwater elevation data, flow direction is partially inferred from topography

North

FRONTIER GEOSERVICES